Issues in Integrating Pavement Management and Preventive Maintenance

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Presentation Topics

- The benefits of integration
- Typical gaps
- Current approaches being used
- Recommendations to improve integration efforts

Differences in Maintenance and Rehabilitation Programs

- Preventive Maintenance
  - Managed by maintenance area
  - In-house or outsourced activities
  - Short lead time before construction
  - Annual program
- Rehabilitation
  - Program developed by planning and programming
  - Executed by construction
  - Constructed under contract
  - Several years from project identification to construction

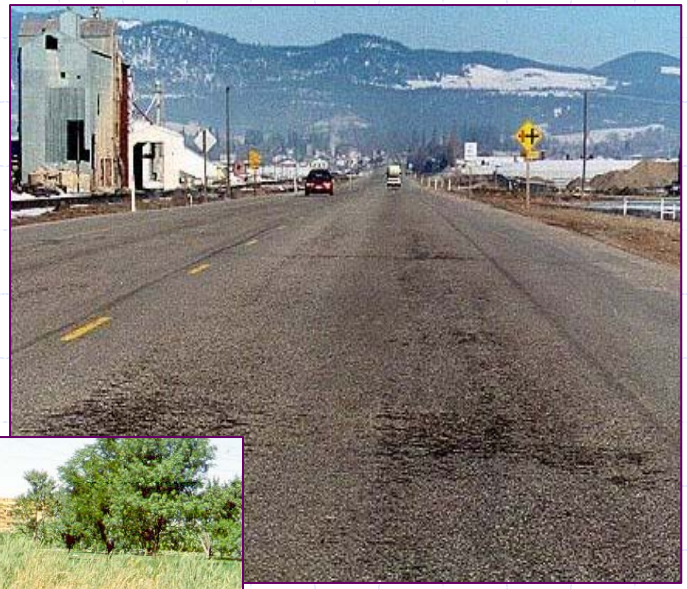
Benefits to Integrating These Areas

- To account for maintenance effects in pavement performance models
- To recognize the benefits associated with preventive maintenance treatments
- To identify the appropriate time to apply preventive maintenance
- To assist with the development of a coordinated, statewide preservation plan

Typical Gaps

- Pavement condition assessment techniques
- Condition indexes
- Pavement performance models
- Pavement treatment rules
- Treatment impact rules

Pavement Condition Assessment



What Distresses Should Be Included?

- What factors trigger the use of a preventive maintenance treatment?
- What benefits are realized by the application of the treatment?

Crack sealing	→	Open or sealed cracks, quantities, severity
	→	Lower severity cracks
Chip seals	→	Oxidation, flushing, raveling
	→	Waterproofed surface, improved friction

Other Condition Assessment Factors

- Survey frequency
  - Is the window of opportunity missed?
  - Can preventive maintenance needs be predicted?
- Processing of condition information
  - How short is the window between identification of the need and construction of preventive maintenance treatments?

Condition Indexes

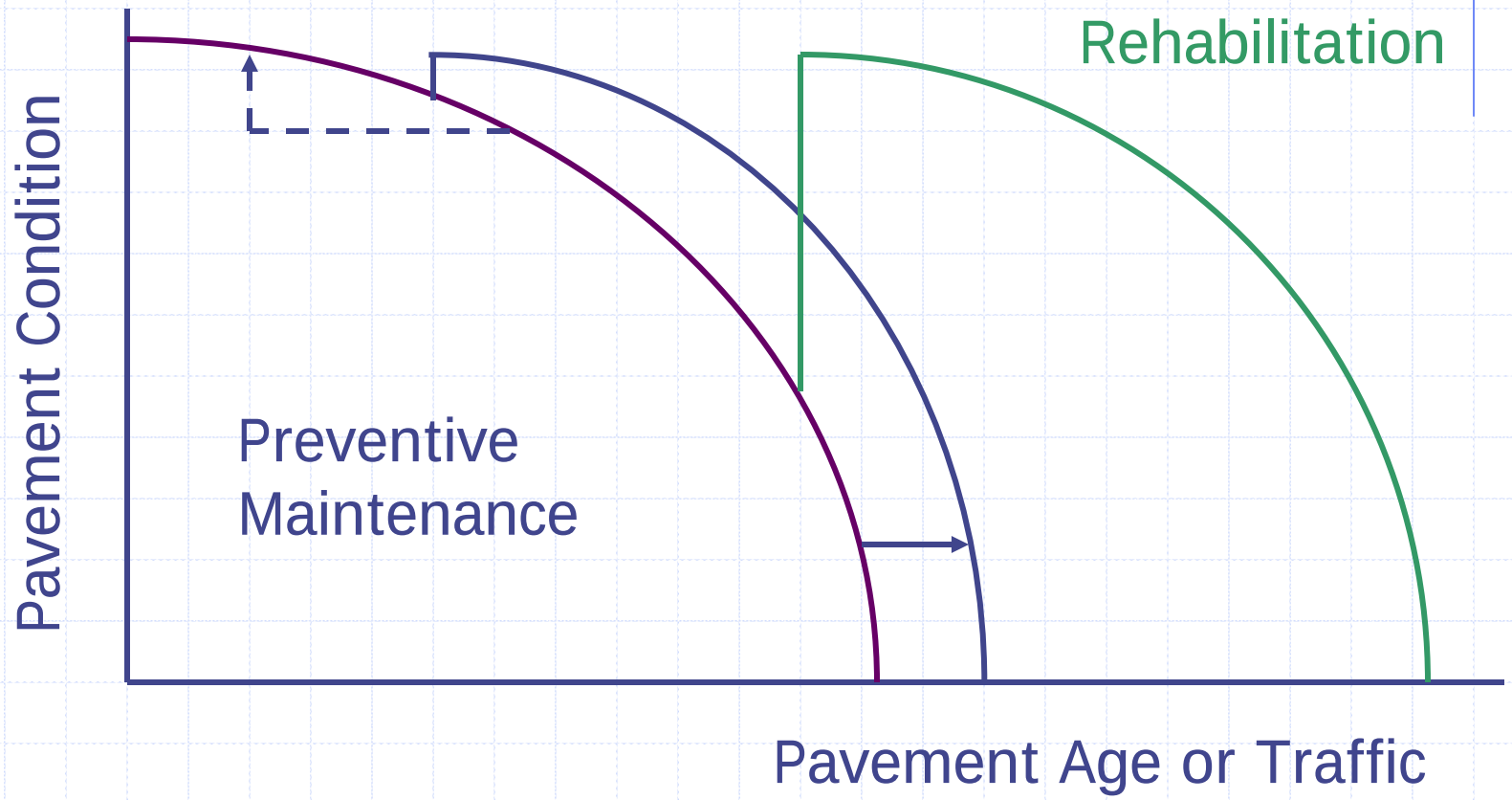
- Single composite index
  - Pavements rated between 70 and 100 might be candidates for preventive maintenance
- Remaining service life (RSL)
  - Pavements with a RSL of 10 years or more might be candidates for preventive maintenance

The appropriate treatment might be hard to identify without specific distress information available

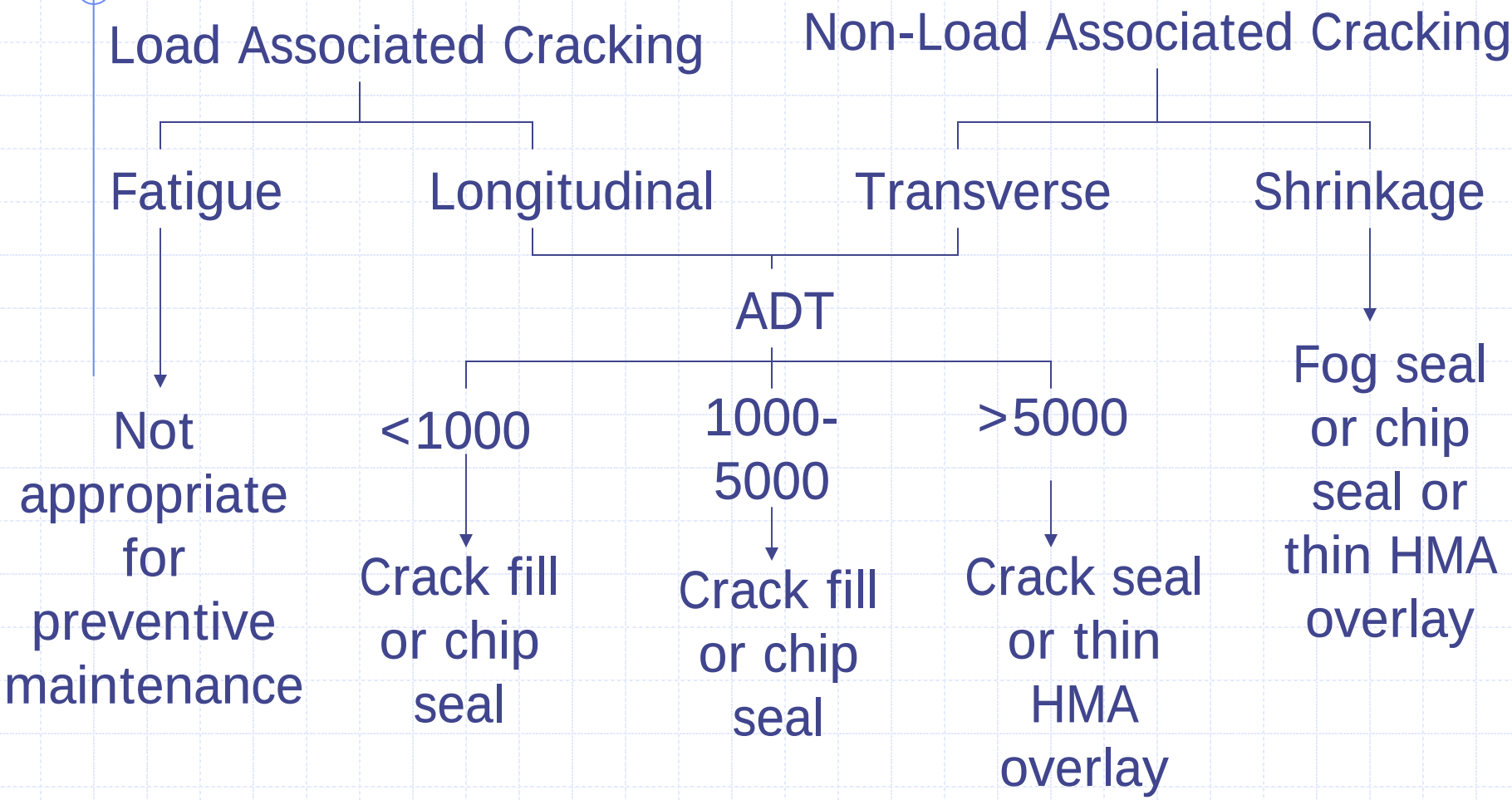
Condition Indexes

- Individual indexes or distress details
  - Friction index (or amount of bleeding) to identify safety needs
  - Structural index (or amount of fatigue cracking) to identify sections that are NOT good candidates for preventive maintenance
  - Cracking index (or amount of L/T cracking) to identify candidates for crack sealing
  - Functional index to identify candidates for seal coats

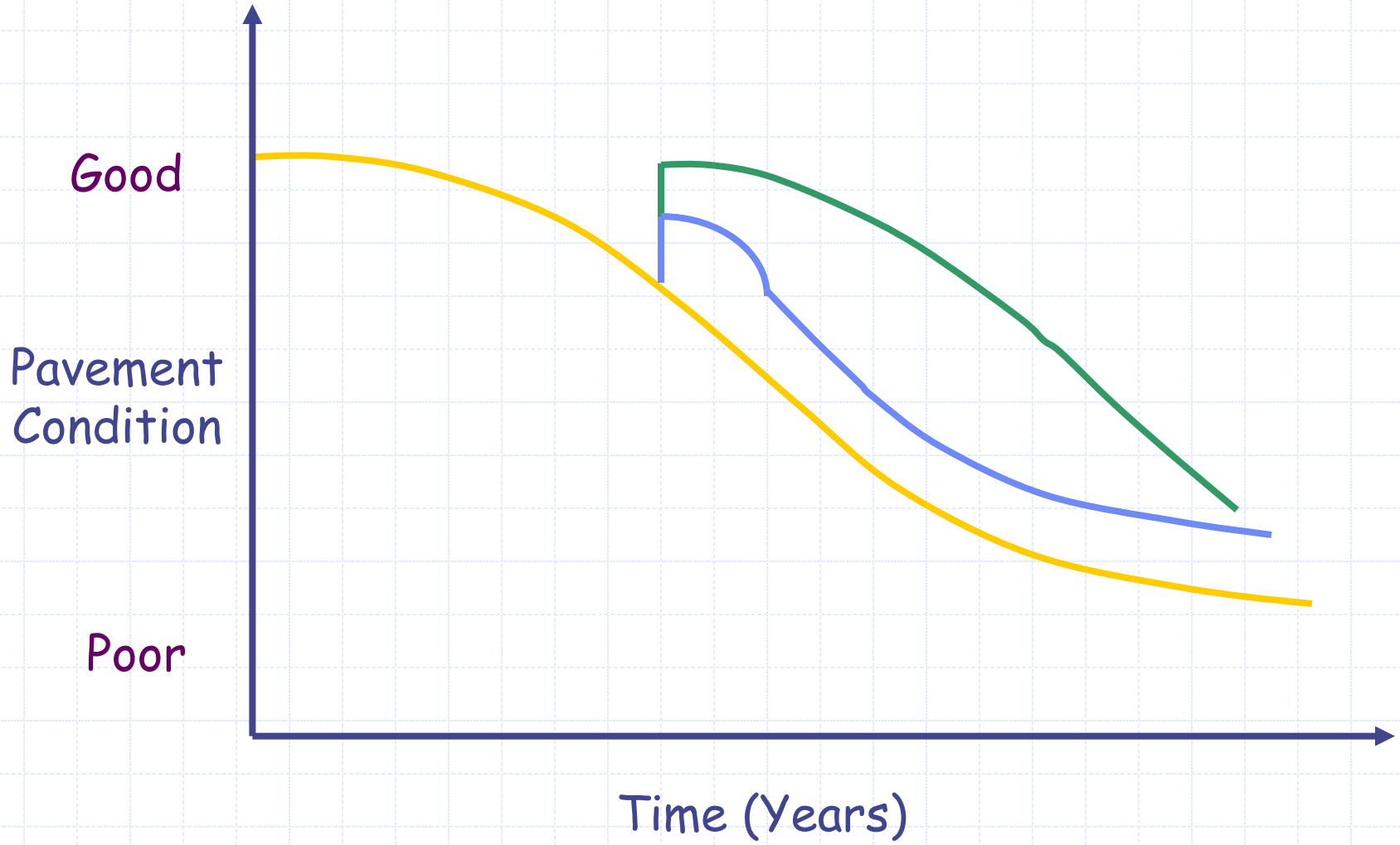
Pavement Performance Models



Pavement Treatment Rules



Treatment Impact Rules



Model Development Issues

- Models must be developed for each treatment type
- The database must be able to provide the information needed to support the models

Approaches to Integration (1)

- Establish treatment rules for rehabilitation and reconstruction
- Pavement sections that are NOT candidates for rehabilitation or reconstruction are candidates for maintenance

Rehabilitation and Reconstruction

OR

Preventive Maintenance Candidate

Approaches to Integration (2)

- Preventive maintenance treatments are considered collectively as a treatment and the specific treatment is not identified

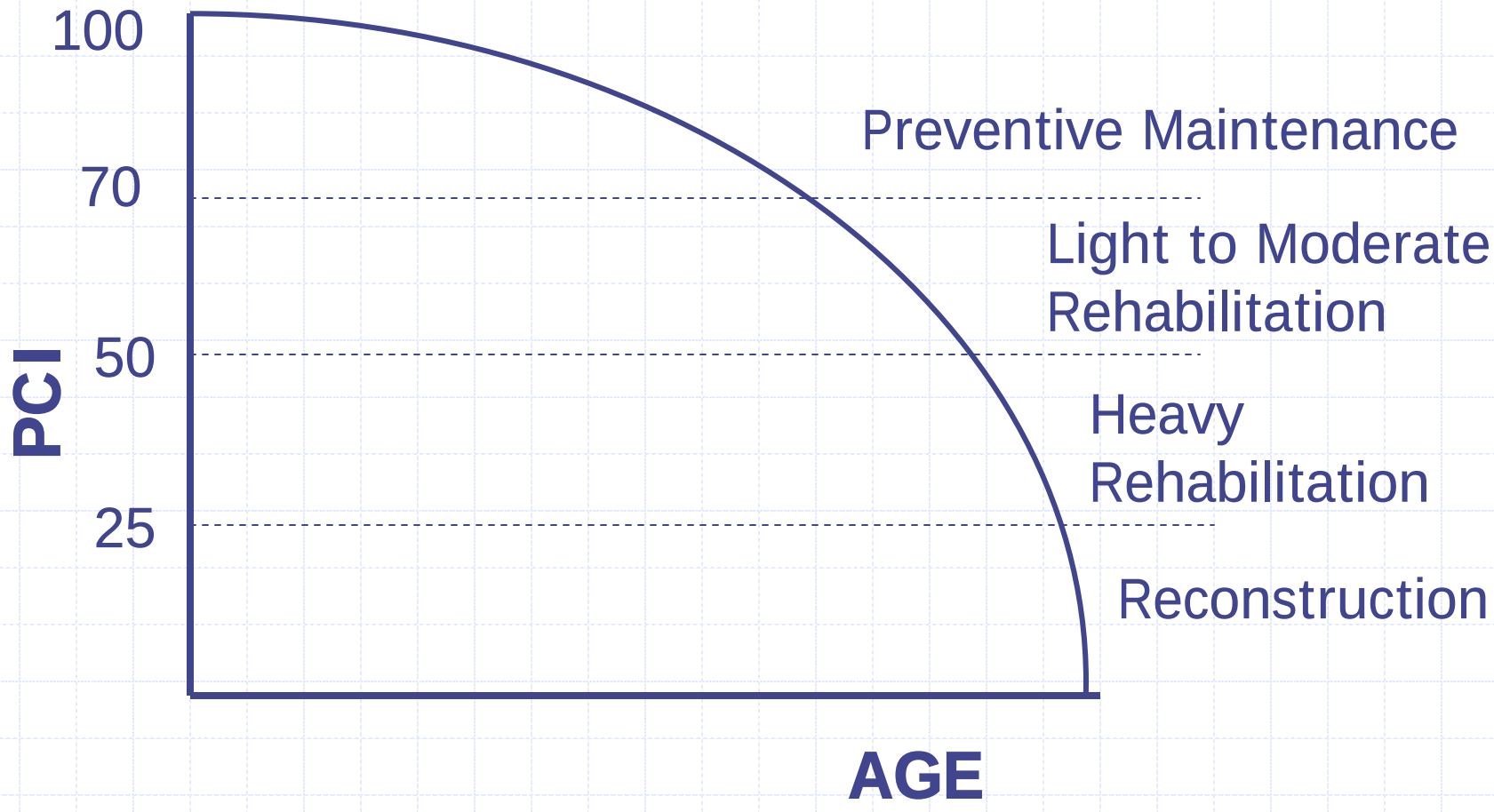
Treatments Considered

Preventive Maintenance
Thin Overlay
Mill and Fill
Structural Overlay
Reconstruction

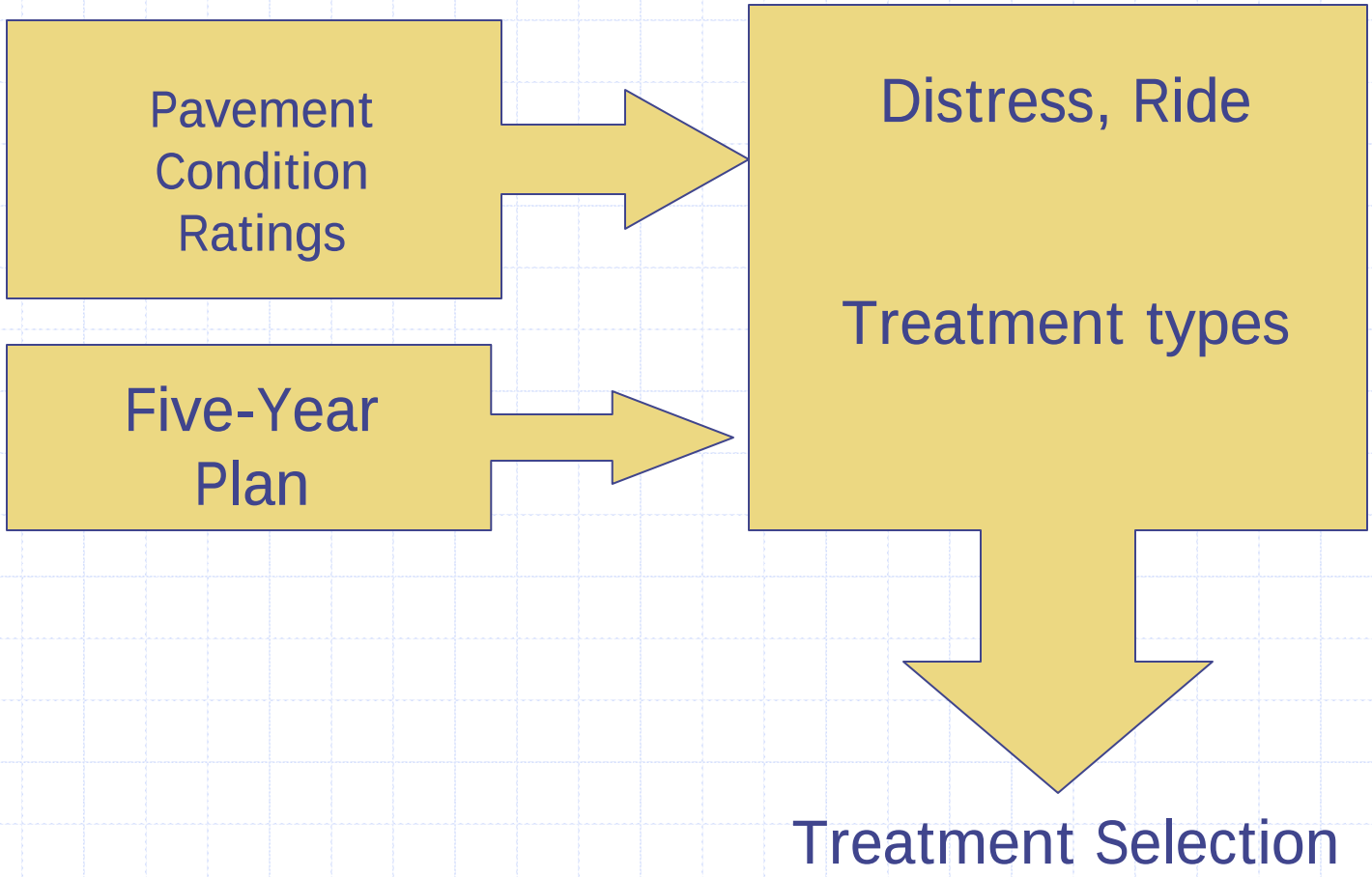
General Recommendations

- Group all preventive maintenance treatments as a single treatment with an average cost and performance period
- Select the category of preventive maintenance for pavements in good condition
- Have Maintenance select the appropriate treatment based on field observations

Example


100
70
50
25
PCI
Preventive Maintenance
Light to Moderate Rehabilitation
Heavy Rehabilitation
Reconstruction
AGE

Caltrans


Pavement Condition Ratings
Five-Year Plan
Distress, Ride
Treatment types
Treatment Selection

Treatment Rules

- Rehabilitation and reconstruction have a pavement distress matrix
- Preventive maintenance treatments are based on
  - locations without defects
  - treatment types
  - project history

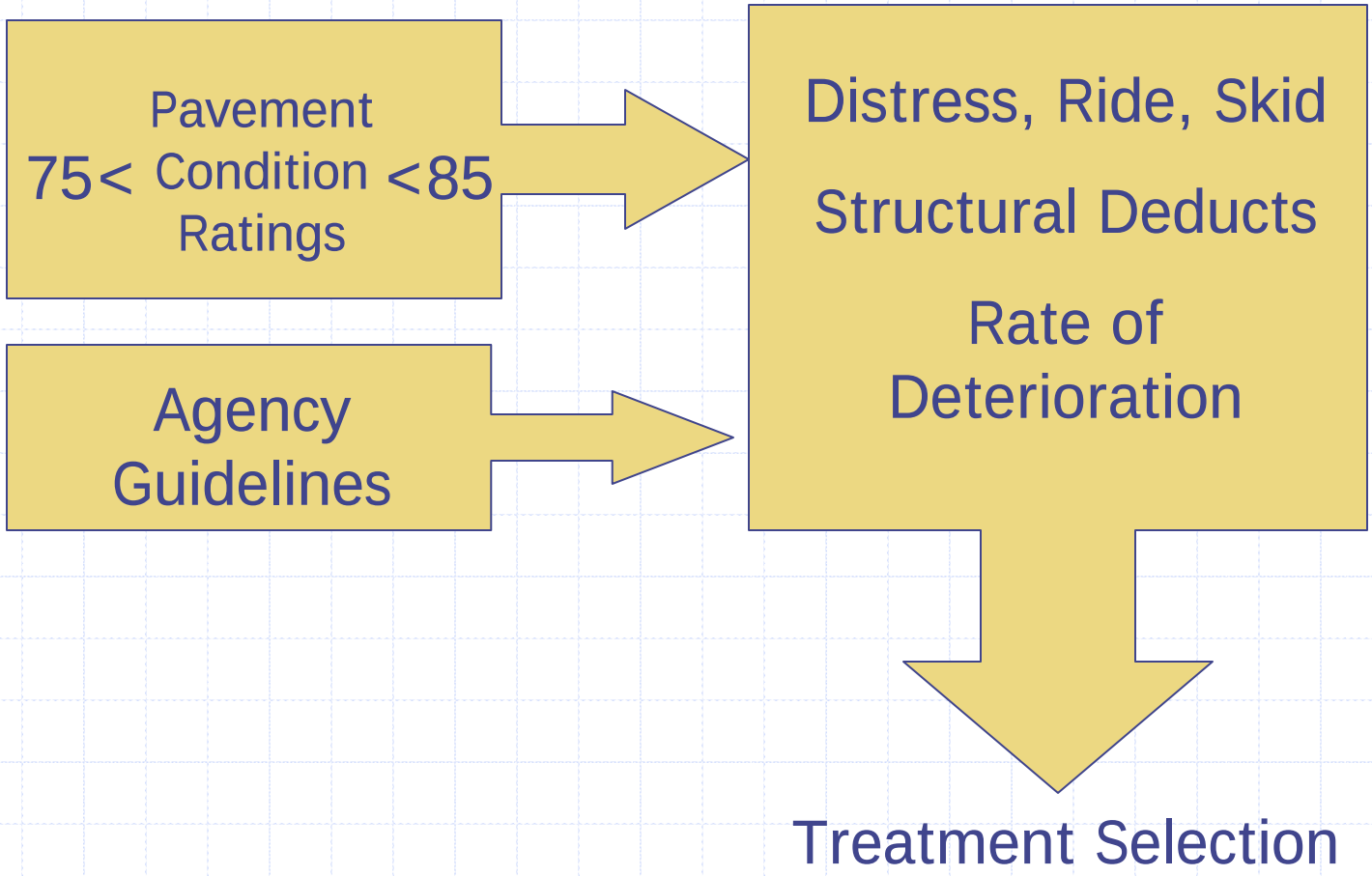
Current Status

- Five-year funding plan for maintenance and rehabilitation includes prevention
  - over $90 million per year
- Developing a pavement condition index with remaining service life
- Developing the performance model for network analysis
- Modifying pavement condition collection
  - to support performance models

Current Status

- Reviewing current business processes
- Identifying gaps
- Developing implementation plan

Ohio Department of Transportation



Treatment Rules Based on Timing

- Rehabilitation and reconstruction activities are triggered based on condition information
- Preventive maintenance treatments are triggered based on time since last activity

Approaches to Integration (3)

- Specific preventive maintenance treatments are recommended based on information available in the pavement management system

Pros and Cons to Approach 3

- Allows an agency to incorporate treatment selection with project identification
- Models can be more specific to the treatment
- Requires more supporting information in the pavement management system

Recommendations

- Examine current capabilities
- Identify gaps between current practices and needs
- Develop a plan to address gaps
- Implement the plan

Thanks!

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